

4-717-66

ACC NR: AP6025396

relative importance of these two processes is determined by the composition and structure of the oligomers. Compared to thermal polycondensation, catalytic polymerization leads to the formation of polymers having a higher glass-transition temperature and a wider temperature range of the highly elastic state; this is due to a greater flexibility and mobility of the chains of their molecules owing to the opening of the cyclic links in the oligomer molecules. Orig. art. has: 5 figures and 3 tables.

SUB CODE 07/ SUBM DATE: 14Feb64/ ORIG REF: 005/ OTH REF: 003

Card

2/2 *DLR*

GOLUBKOV, I. A.

PA 50/49T45

USSR/Geology
Terminology

May 49

"The Problem of 'Polyunits' Deposits of the Eastern Carpathians," I. A. Golubkov, Ye. V. Myshlyuk, 2 pp.

"Dokl Ak Nauk BSSR" Vol LXVI, No 1

Suggests changing the name "Polyunits" to "Bagyevich" strata to correspond with locality of highest development in the region north of Bagyevich along the Raduchev River. They contain sandy clayey limestones schists with layers of grey siliceous, quartz-micaceous sandstones and

50/49T45

USSR/Geology (Contd)

May 49

Various fauna. Submitted by Acad S. I. Mironov, 25 Feb 49.

50/49T45

GOLUBKOV, I.A.; KORNEYNVA, V.G.

Stratigraphy of the Lower Miocene of the cis-Carpathian regional depression.
(MLRA 6:11)
Dokl.AN SSSR 93 no.3:527-529 N '53.

1. Vsesoyuznyy neftyanoy nauchno-issledovatel'skiy geologo-rasvedochnyy
institut. Predstavleno akademikom S.I.Mironovym.
(Transcarpathia--Geology) (Geology--Transcarpathia)

ALEKSEYCHIK, Stepan Nikolayevich; pri uchastii sleduyushchikh: GAL'TSEV-BEZYUK, S.D.; GHEDIN, K.I.; ZAYTSEV, S.M.; KIRICHEK, M.A.; KOZLOV, A.L.; FURKIN, L.B.; RATNER, V.Ya.; RATHOVSKIY, I.I.; RAKHMANOV, K.F.; TABOYAKOV, A.Ya.; TSITENKO, N.D.; GOLUBKOV, I.A., nauchnyy red.; KELAREV, L.A., vedushchiy red.; YASHCHURZHINSKAYA, A.B., tekhn.red.

[Geology and gas and oil potentials of northern Sakhalin]
Geologicheskoe stroenie i gazoneftenosnost' severnoi chasti Sakhalina. Leningrad, Gos. nauchn. -tekh.izd.-vo nef. i gorno-toplivnoi lit-ry Leningr. otd-nie, 1959. 226 p. (Leningrad.Vsesoiuznyi nef. nauchno-issledovatel'skii geologorazvedochnyi institut. Trudy, no.135).

(Sakhalin--Petroleum geology)

(Sakhalin--Gas, Natural--Geology)

D'YAKOV, B.F.; GOLUBKOV, I.A.

Brief outline of the activity of the All-Union Petroleum
(Scientific Research) Geological Prospecting Institute.
Trudy VNIGRI no.132:3-13 '59. (MIRA 17:1)

FAYNLEYB, B.N.; GOLUBKOV, I.G.; KOCHER, L.A.; BALAKIN, V.I.,
kand. tekhn. nauk, retsenzent; TUKHSHNAYD, A.M., inzh.
red.

[Methods for testing and investigating the fuel systems
of motor-vehicle and tractor diesel engines] Metody is-
pytani i issledovani toplivnoi apparatury avtotraktor-
nykh dizelei. Moskva, Mashinostroenie, 1965. 174 p.
(MIRA 18:9)

GOLUBKOV, I.V., inzhener.

Steam superheater pipe seal. Energetik 1 no.6:16-17 N '53. (MIRA 6:11)
(Superheaters)

AID P - 3230

Subject : USSR/Electricity
Card 1/1 Pub. 29 - 15/30
Author : Golubkkov, I. V., Eng.
Title : Making a power train more efficient
Periodical : Energetik, 8, 15-17, Ag 1955
Abstract : A power train of the D-1000 type operating in a northern region for nine years was improved in many respects. The author describes the various improvements introduced by the personnel of the station. Four drawings.
Institution : None
Submitted : No date

1. GOLUBKOV, K. A., Eng.; MATEK, M. M., Eng.
2. USSR (600)
4. Windlass
7. Modernized winch U 2-4-5 of Ural Machine Building Plant construction,
Vest. mash., 32, No. 6, 1952.

9. Monthly List of Russian Accessions, Library of Congress, April, 1953, Uncl.

GOLUBKOV, K.A.

Design and assembly of tin plate manufacture equipment. Sbor.st.
UZTM no.1:97-139 '58. (MIRA 11:12)
(Tinning--Equipment and supplies) (Rolling mills)
(Metal-cutting tools)

25(5)

SOV/117-59-5-2/30

AUTHORS: Golubkov, K.A., and Satovskiy, B.I., Assistant Chief Designers, Engineers

TITLE: To Build the Best Machines in the World (From the Experience of the Uralmashzavod)

PERIODICAL: Mashinostroitel', 1959, Nr 5, pp 3-6 (USSR)

ABSTRACT: The article lists the Uralmashzavod production, already completed, current and planned. The importance of the Uralmashzavod is illustrated by the fact that in 1957, 75% of the ore in the USSR was processed by machines made by this plant, 80% of the oil was extracted by using Uralmashzavod machinery, etc. The following outstanding equipment items in the production or planning stages are listed; mining excavators with 3 to 8 cu m bucket capacity, walking excavators with 10, 14, and 20 cu m buckets (among them the biggest walking excavator in the world with a 25 cu m bucket and a 100 m jib). The designing of a walking excavator with a 50 cu m bucket and a 125 m jib has started. The plant is producing various presses, among them 30 thousand-ton stamping presses, 12 and 20 thousand

Card 1/2

SOV/117-59-5-2/30

To Build the Best Machines in the World (From the Experience of the Ural-mashzavod)

-ton horizontal presses, etc. The plant is also planning the production of a unit for a 2,286 cu m blast furnace, new oil well drilling installation types "Uralmash-9D" and "Uralmash-11DE", which may be transferred from one place to another in 3-5 days (instead of the 28 to 35 days needed now), etc. The high automation and mechanization level, the improved dependability, the introduction of pneumatic and hydraulic drives on a large scale, the use of electronic equipment, etc, will increase the productivity of the machines produced.

ASSOCIATION: Uralmashzavod

Card 2/2

KHIMICH, Georgiy Lukich, inzh.; GOLUBKOV, Konstantin Alekseyevich;
KONDRATOV, Yuriy Nikolayevich; NISKOVSKIKH, Vitaliy
Maksimovich; SIDELEV, Nikolay Petrovich; PAL'MOV, Ye.V.,
doktor tekhn. nauk, retsenzent; DUGINA, N.A., tekhn. red.

[Improving the quality and economic efficiency of machinery]
Povyshenie kachestva i ekonomichsnoti mashin. Pod red. G.L.
Khomicha. Moskva, Mashgiz, 1962. 124 p. (MIRA 15:7)
(Machinery industry)

GOLUBKOV, K.A.

37

PHASE I LOOK EXPLOITATION

SOV/5985

Rokotyan, Ye. S., Doctor of Technical Sciences, ed.

Prokatnoye proizvodstvo; spravochnik (Rolling Industry; Handbook) v. 1. Moscow, Metallurgizdat, 1962. 743 p. Errata slip inserted. 9250 copies printed.

Authors of this volume: B. S. Azarenko, Candidate of Technical Sciences; V. D. Afanas'yev, Candidate of Technical Sciences; M. Ya. Brovman, Engineer; M. P. Vavilov, Engineer; A. B. Vernik, Engineer; K. A. Golubkov, Engineer; S. I. Gubkin, Academician, Academy of Sciences USSR; A. Ye. Gurevich, Engineer; V. I. Davydov, Candidate of Technical Sciences; V. G. Drozd, Engineer; N. F. Yermolayev, Engineer; Ye. A. Zhukovich-Stopha, Engineer; H. M. Kirilin, Candidate of Technical Sciences; M. V. Kovynov, Engineer; A. M. Kogos, Engineer; A. A. Korolev, Professor; M. Ye. Kugayenko, Engineer; A. V. Laskin, Engineer; B. A. Levitanskiy, Engineer; V. M. Lugovskoy, Engineer; I. M. Moyerovich, Candidate of Technical Sciences; M. S. Ovecharov, Engineer; V. I. Pasternak, Engineer; I. L. Perlin, Doctor of Technical Sciences; I. S. Pobedin, Candidate of Technical Sciences; Ye. S. Rokotyan, Doctor of Technical Sciences; M. M. Sar'yan, Candidate of Technical Sciences; V. V. Smirnov, Candidate of Technical Sciences; V. S. Smirnov, Corresponding Member, Academy of Sciences USSR; O. P. Sokolovskiy,

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SOV/5985

Rolling Industry; Handbook

Engineer; O. P. Solov'yev, Engineer; M. A. Sidorkovich, Engineer; Ye. M. Trut'yakov, Engineer; I. S. Trishovskiy, Candidate of Technical Sciences; G. N. Khenkin, Engineer; and A. I. Tsolikov, Corresponding Member, Academy of Sciences USSR. Introduction: A. I. Tsolikov, Corresponding Member, Academy of Sciences USSR; Ye. S. Mokotyan, Doctor of Technical Sciences; and L. S. Al'shevskiy, Candidate of Technical Sciences.

Eds. of Publishing House: V. M. Gorobinchenko, R. M. Golubchik, and V. A. Rymov; Tech. Ed.: L. V. Dobuzhinskaya.

PURPOSE: This handbook is intended for technical personnel of metallurgical and machine-building plants, scientific research institutes, and planning and design organizations. It may also be useful to students at schools of higher education.

COVERAGE: The fundamentals of plastic deformation of metals are discussed along with the theory of rolling and drawing. Methods of determining the power consumption and the forces in rolling with plane surface or grooved rolls are .

Card 2/13

Rolling Industry; Handbook

SOV/5985

1. General characteristics of modern tube-welding machines	588
2. Tube manufacturing by the continuous furnace-welding process	561
3. Tube manufacturing by electrical resistance welding	568
4. Tube manufacturing by induction welding	572
5. Tube manufacturing by electric-arc welding	573
Ch. 24. Wheel-Rolling Mill of UZTM Design <u>(K. A. Golubkov)</u>	
1. Outline of the process and equipment for railroad wheel manufacture	582
2. Gravitational transfer table	584
3. Ingot-cutting machines	584
4. Ingot breakers	585
5. Manipulators	585
6. Rotary hearth furnaces 24 or 28 m in diameter	586
7. Steam hydraulic press of 3000-ton capacity	586
8. Transfer equipment	587
9. Steam hydraulic press of 7000-ton capacity	587
10. Wheel-rolling mill	588
11. Steam-hydraulic press of 2500-ton capacity	590

Card 15/19

GOLUBKOV, LEONID IVANOVICH

PARSHIN, Aleksandr Vasil'yevich, inzhener; GOLUBKOV, Leonid Ivanovich;
TIRABSHEV, A.I., inzhener, redaktor; VERINA, G.P., tekhnicheskii
redaktor.

[Highly efficient poperation of locomotives; the practices of
the Kagan Depot on the Ashkhabad railroad] Vysokoproizvoditel'noe
ispol'zovanie teplovozov; opyt depo Kagan Ashkhabadskoi dorogi.
Moskva, Gos.transp.shel-dor.izd-vo, 1957. 36 p. (MLRA 10:6)

1. Nachal'nik teplovoznogo depo Kagan Ashkhabadskoy dorogi (for Parshin)
2. Starshiy dispatcher otdeleniya Ashkhabadskoy dorogi (for Golubkov)
(Locomotives)

CHIPIZHENKO, A.I.; KATYSHKOVA, A.Ya.; GOLUBKOV, M.K.

Tendency of copper-beryllium alloys to the formation of bubbles when heated in an ammonia atmosphere. Trudy Giprotsvetmetchbratka no.18: 197-208 '60.

(MIRA 13:10)

(Copper-beryllium alloys--Heat treatment)

18-1230

28547

S/137/61/000/009/019/087
A060/A101

AUTHORS: Chipizhenko, A.I., Katyshkova, A.Ya., Golubkov, M.K.

TITLE: Tendency of copper-beryllium alloys to form blisters under heating in an ammonia environment

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 9, 1961, 41, abstract 9D305 ("Tr. Gos. n.-i. i poyektn. in-ta po obrabotke tsvetn. met.", 1960, no. 18, 197-208)

TEXT: The influence of the chemical composition of bronze upon the tendency to form blisters under heating in an ammonia environment was investigated. Strips of bronze grades ~~Sp.5~~ 2.5 (Br.B 2.5) containing (in percent): Be 1.53-2.43, Ni 0.18-0.49, and admixtures of Ti 0.18-0.73 and Co 0.3; BNT 1.9 and 5HT 1.7 (BNT 1.9 and BNT 1.7) were heated in an ammonia environment at 770-780 and 820°C (for the latter two grades) for various periods of time. It was established that standard bronze grade Br. B 2.5 is most apt to form blisters. Under heating for the period of one hour in strips with an addition of 0.28-0.73% Ti the blisters did not arise. On strips of bronze containing 1.68-2.32% Be and an admixture of Ti no blisters were formed even after a two-hour heating. Under heating of strips

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X

Tendency of copper-beryllium alloys ...

28547
S/137/61/000/009/019/087
AO60/A101

in a H_2 atmosphere at $820^\circ C$ for 20 min no blisters were formed on strips of bronze containing an admixture of Ti with Ni, while on strips of bronze Br. B 2.5 a large number of blisters was formed. It is indicated that the formation of blisters on strips of beryllium bronze under heating in an ammonia atmosphere is connected with defects in the ingot and the action of H_2 from the surrounding environment. An admixture of Ti reduces the tendency of strips to form blisters. It is recommended to carry out the casting of beryllium bronze ingots by the semicontinuous or flowless method, and not to allow a heating $> 780^\circ C$ and long soakings in annealing strips or parts in an ammonia environment.

A. Babayeva

[Abstracter's note: Complete translation]

Card 2/2

L 10934-66 EWI(m)/ENP(w)/T/ENP(t)/ENP(z)/ENP(b)/EWA(h) IJP(c) JD/HM

ACC NR: AP5028552

SOURCE CODE: UR/0286/65/000/020/0167/0167

INVENTOR: Chipizhenko, A. I.; Iodinskaya, Z. M.; Golubkov, M. K.; Bliznyukova, N. Yu.

ORG: none

TITLE: Copper-base alloy. Class 40, No. 160827

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 20, 1965, 167

TOPIC TAGS: copper alloy, zinc containing alloy, nickel containing alloy, aluminum containing alloy, manganese containing alloy, silicon containing alloy, high strength alloy, *copper base alloy, tensile strength*

ABSTRACT: This Author Certificate introduces a copper-base alloy containing nickel, aluminum, manganese, and zinc. To increase the tensile strength and relaxation strength of the alloy, the component contents are kept within the limits: copper 73.0—76.0%, nickel 1.5—3.0%, aluminum 1.5—3.0%, manganese 0.3—1.0%, silicon 0.3—1.0%, and balance zinc.

[DV]

SUB CODE: 11/ SUBM DATE: 30Jul63/ ATD PRESS: 4170

Card 1/1

UDC: 669.35.5.71

GOLUBKOV, N., inzh.

Preventing and eliminating swellings in roads. Avt. dor. 27
no. 3:30 Mr '64. (MIRA 17:5)

GOLUBKOV, N.A.; PISHVANOV, I.S.

Stratigraphic aspects of the Kalusha beds in Transcarpathia.
Dokl. AN SSSR 94 no.4:741-743 F '54. (MLRA 7:2)
(Kalusha--Geology, Stratigraphic) (Geology, Stratigraphic--
Kalusha)

GOLUBEKOV, N.D., inzhener; TOLKUNOV, I.M., inzhener.

For higher quality in the construction of automobile roads. Avt.dor.
17 no.2: 6-7 S-O '54. (MIRA 8:4)
(Road construction)

SILOVA, R.G.; KUCHEROVA, G.S.; POPOVA, A.M., starshiy tekhnik; MECHIK, N.A., radiomekhanik, rukovoditel' brigady kommunisticheskogo truda; GOLUBKOV, N.I., nadsmotrshchik, udarnik kommunisticheskogo truda; MAROVICH, A.F., rukovoditel' brigady kommunisticheskogo truda

Leading workers and innovators share their experiences with communications workers. Vest. svyazi 20 no.8:15-17 Ag'60.
(MIRA 13:10)

1. Brigadir telegrafistov sluzhby gorodskikh telegrafnykh svyazey Tsentral'nogo telegrafa SSSR (for Silova).
 2. Pomoshchnik nachal'nika 245-go otdeleniya svyazi g.Moskvy (for Kucherova).
 3. Moskovskaya gorodskaya telefonnaya set' (for Popova).
 4. Televizionnoye atel'ye No.38 (for Mechnik).
 5. Moskovskaya gorodskaya radiotranslyatsionnaya set' (for Golubkov).
 6. Nachal'nik pochtovogo vagona Otdeleniya perevozki pochty na Kurskom vokzale v Moskve (for Marovich).
- (Telecommunication--Employees)

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GOLUBOV, N. P., kand. tekhn. nauk, dotsent; DUMANSKAYA, V. A., kand.
tekhn. nauk, dotsent

Machinability of stainless steel. Vest. mashinostr. 42 no.10:73
0 '62. (MIRA 15:10)

(Steel, Stainless)

GOLUBKOV, N.S., aspirant

Operational indices of a worm spiroid transmission. Izv.vys.ucheb.
zav.; mashinostr. no.2:81-85 '61. (MIRA 14:3)

1. Izhevskiy mekhanicheskiy institut.
(Gearing, W orm)

EYDINOV, Mikhail Solomonovich, dots., kand. tekhn. nauk; ZOTOV, B.D., kand.
tekhn. nauk; GOLUBKOV, N.S., inzh.; PLOTNIKOV, V.S., inzh., red.;
~~DUGINA, N.A., tekhn. red.~~

[Design of tooth and worm gears] Raschet zubchatykh i cherviachnykh
peredach. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry,
1961. 215 p. (MIRA 14:7)

(Gearing)

ZOTOV, B.D.; GOLUBKOV, N.S.

Spiroid worm gear transmissions. Mashinostroitel'
no.9:35 S '62. (MIRA 15:9)
(bearing, Worm)

GOLUBKOV, N. Ye.

"Investigation of a Three Conveyer Electromechanical Transmission System."
Ural Polytechnic Inst imeni S. M. Kirov, Min Higher Education USSR, Sverdlovsk,
1955. (KL, No 15, Apr 55)

SO: Sum. No. 704, 2 Nov 55 - Survey of Scientific and Technical Dissertations Defended
at USSR Higher Educational Institutions (16).

GOLUBKOV, N.Ye.

Errors in measurements made by reactive meters in connection
with unsymmetrical loads. Nauch.dokl.vys.shkoly; energ.
no.2:67-69 '59. (MIRA 13:1)

1. Rekomendovana sektsiyey elektrifikatsii Stalingradskogo
sel'skokhozyaystvennogo instituta.
(Electric meters)

GOLUBKOV, N.Ye.; KRIVENTSEV, V.I.;

[Calculating the efficiency of single-row differential
and planetary mechanisms] O vychislenii KPD odnoriad-
nykh differentsial'nykh i planetarnykh mekhanizmov;
monografiia. Stalingrad, Izd-vo M-va sel'khoz. in-ta,
1959. 23 p. (MIRA 16:7)

(Mechanisms)

GOLUBKOV, N.Ye., kand.tekhn.nauk, dotsent

New method for measuring inverse sequence resistances of synchronous generators. Trudy Frunz. politekh. inst. no. 6:35-40 '62.

Electromagnetic clutch with inverted field. Ibid.:75-84
(MIRA 17:9)

GOLUBKOV, C. Z.

GOLUBKOV, O. A.: "Some Pathophysiological Data on Higher Nervous Activity in Epilepsy Patients." Ryazan' Medical Inst imeni Academician I.P. Pavlov. Ryazan', 1956. (Dissertation for the Degree of Candidate in Medical Science)

So: Knizhnaya Letopis', No. 19, 1956.

GOLUBKOV, O.Z., kand.meditsinskikh nauk

Respiratory component of the conditioned reflexes in patients
with a variable course in epilepsy. Sbor. trud. Kursk. gos. med.
inst. no.13:411-414 '58. (MIRA 14:3)

1. Iz kliniki psikiatrii (ispolnyayushchiy obyazannosti zav. -
kand. meditsinskikh nauk O.Z.Golubkov) Kurskogo gosudarstvennogo
meditsinskogo instituta.

(CONDITIONED RESPONSE)
(EPILEPSY)

(RESPIRATION)

BRAGINSKAYA, R.S.; GOLUBKOV, O.Z.; GORDOVA, T.N.; L'VOVSKAYA, V.F.;
LUK'YANCHIKOVA, M.L.

Dynamics of schizophrenia as revealed by materials from a catamnestic study of patients of the Kursk Psychoneurological Dispensary. Report No.1: Dynamics of therapeutic remissions. Sber. trud. Kursk. gos. med. inst. no.13:418-423 '58. (MIRA 14:3)

1. Iz kliniki psikiatrii (ispolnyayushchiy obyazannosti zav. -
kand. meditsinskikh nauk O.Z.Golubkov) Kurskogo gosudarstvennogo
meditsinskogo instituta; Nauchnyy rukovoditel' raboty prof. T.N.
Gordova.

(SCHIZOPHRENIA)

GOLUBKOV, O.Z.

Some pathophysiological neural mechanisms of epileptic oligo-
phasia. Zhur. nevr. i psikh. 65 no.9:1365-1370 '65. (MIRA 18:9)

1 Klinika psikhiiatrii (zaveduyushchiy - dotsent O.Z. Golubkov)
Altayskogo meditsinskogo instituta, Barnaul.

GOLUBKOV, P.

Economic efficiency of mechanizing agricultural production.
Vop. ekon. no.11:131-135 N '63. (MIRA 17:2)

GOLUBKOV, P.

Collective Farms

Economics of a large collective farm ("Stalin collective Farm" I. YE Apal'kov, Reviewed by P. Golubkov.) Vop. ekon, No. 11, 1951.

Monthly List of Russian Accessions, Library of Congress, May 1952, Unclassified.

GOLUBKOV, P.

Collective Farms

"Problems of collective farm building in the U.S.S.R." I.D. Lapteva, V.P.D'Yachenko, A. Karavayeva; eds. Reviewed by P.Golubkov. Vop. ekon. no. 4, April 1952.

MONTHLY LIST OF RUSSIAN ACQUISITIONS, LIBRARY OF CONGRESS, AUGUST 1952. UNCLASSIFIED.

GOLUEKOV, P. A., KHACHATURYAN, G. G.

IVACHOV, F.

Books on the economics of agriculture. Sov. kniga. no. 7, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952, Uncl.

1. GOLUBKOV, P. A.
2. USSR (600)
4. Collective Farms
7. Literature on the economy of leading collective farms. Reviewed by P. A. Golubkov. Sov. kniga no. 11, 1952.

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

1. GOLUBKOV, P.
2. USSR (600)
4. Agriculture
7. Problems in the development of agriculture in the U.S.S.R. during the fifth five-year plan. Vop. ekon. no. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, May 1953. Unclassified.

GOLUBKOV, P.A., kandidat ekonomicheskikh nauk.

Preachers of hunger and poverty. Nauka i zhizn' 20 no.10:41-43 0 '53.

(MLBA 6:10)

(Malthusianism)

GOLUBEKOV, P. A.

Vsenarodnoe delo A nationwide cause Moskva, Goskul'tprosvetizdat, 1954. 38 p.

1. Agricultural laws and legislation - Russia.

GOLUBKOV, P.

An important factor in the great expansion of agriculture ("The
new planning system in practice." Reviewed by P. Golubkov).
Vop.ekon. no.5:137-141 My '56. (MLRA 9:8)
(Agricultural administration)

GOLUBKOV, P.

Problems in the over-all mechanization of agriculture, "Problems in the comprehensive mechanization of collective farm production" by V.G.Vensher. Reviewed by P.Golubkov. Vop.ekon.no.12:126-131 D '56. (MLRA 10:2)
(Collective farms) (Farm mechanization) (Venzher, V.G.)

Golubkov, P.

GOLUBKOV, P.

Forty years of a socialist economy and culture ("Achievements
of the Soviet regime for 40 years in figures". Reviewed by
P. Golubkov). Vop.ekon. no.10:141-149 0 '57. (MIRA 10:12)
(Russia--Economic conditions--Statistics)

GOLUBKOV, P.; OVCHINNIKOVA, V.

Undivided funds of collective farms and intercollective farm
production cooperation. Vop.ekon. no.12:81-94 D '58.

(MIRA 11:12)

(Collective farms--Finance)

GOLUBKOV, P.

("Distribution and specialization of agricultural production in the U.S.S.R." by N.V. Vasil'ev. Reviewed by P. Golubkov). Vop. ekon. no.3:70-74 Mr '60. (MIRA 13:2)
(Agriculture economic aspects)

GOLUBEKOV, P.

Problems in developing collective farms along the path to communism.
Vop. ekon. no.11:57-70 N '61. (MIRA 14:11)
(Collective farms)

GOLUBKOV, P.

"Building of communism in the U.S.S.R. and agricultural development."
Vols.4-5. by N.S.Khrushchev. Reviewed by P.Golubkov. Vop.ekon.
no.4:33-40 Ap '63. (MIRA 16:4)

(Khrushchev, Nikita Sergeevich, 1894)
(Agricultural policy)

GOLUBKOV, P.V.

26031 Golubkov, P.V. Nekotoryye Itogi Nauchnoy Deyatelnosti Saratovskogo
Universiteta. Vestnik Vyssh. Shkoly, 1948, No. 6, S. 40-43.

SO: Letopis' Zhurnal Statdy, No. 30, Moscow 1948

8-0443K04 P. 1.

IVYRONOVA, V.I., prof.; GOLUBKOV, B.V., prof., red.; KONDILENKO, I.I., dots., red.; GURTOVOY, M.Ye., dots., red.; MARIANASHVILI, M.M., dots. red.

[Program in general physics for physics and physicomathematics faculties of state universities] Programma po boshchei fizike dlia fizicheskikh i fiziko-matematicheskikh fakul'tetov gosudarstvennykh universitetov. [Kiev] Izd-vo Kievskogo gos. univ. Pt.1. [Mechanics. Molecular physics. Electricity and magnetism. Optics] Mekhanika. Molekuliarnaia fizika. Elektrichestvo i magnetizm. Optika. 1956. 8 p. (MIRA 11:3)

1. Russia (1923- U.S.S.R.) Ministerstvo vysshego obrazovaniya. (Physics--Study and teaching)

GOLUBEKOV, P.V., prof.; TSDMRING, Sh.Ye., assistant.

Second All-Union Conference of the Ministry of Higher Education of
the U.S.S.R. on Radio and Electronics. Izv. vys. ucheb. zav.; radio-
tekh. no.1:123-128 Ja-F '58. (MIRA 11:4)
(Radio--Congresses) (Electronics--Congresses)

SOV/109-3-3-22/23

AUTHORS: Golubkov, P.V. and Tsimring, Sh. Ye.

TITLE: The Second All-Union Conference on Radioelectronics of the Ministry of Higher Education of the USSR (Vtoraya vsesoyuznaya konferentsiya MVO SSSR po radioelektronike) - News Item

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 3, pp 440 - 444 (USSR)

ABSTRACT: The conference took place during September 23 - 29, 1957, at Saratovskiy gosudarstvennyy universitet imeni N.G. Chernyshevskogo (Saratov State University imeni N.G. Chernyshevskiy). Apart from the universities, the conference was attended by the representatives of some scientific research institutes of the Soviet and Ukrainian Academies of Science, various industrial establishments and the interested ministries. This arrangement stimulated the discussion and evaluation of the papers presented and permitted the determination of plans for the future research to be carried out by the universities in the field of radioelectronics. In view of a large number of papers and communications (over 150), the majority of these were read in various sections (electrodynamics, electronics, radiowave

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propagation, radio-astronomy and radiospectroscopy, semi-conductors and their application in radio equipment). During the plenary session on September 23, two papers were read: "Development Trends of UHF Electronics in the Soviet Union" by N.D. Devyatkov and "Electromagnetic Waves in the System of Vari-directional Electron Beams" by V.M. Lopukhin. N.D. Devyatkov presented numerous factual data illustrating the rapid development of the U.H.F. electronics in the Soviet Union and the vast contribution of the Soviet scientists to the theoretical foundations of this science; he also discussed the development trends of U.H.F. electronics in the immediate future. The paper described a number of original Soviet U.H.F. devices. The work of V.M. Lopukhin was concerned with the theoretical investigation of the phenomena taking place in multi-ray devices whose electron beams have different directions. The author showed that the presence of the electron beams which are perpendicular to the axis x facilitates the appearance of the solutions which are increasing functions of x for the case of n rays directed along the axis x ; it also leads to the

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appearance of exponentially increasing solutions in the presence of one beam in the above direction. The Electronics Section comprised 50 papers; more than one-third of these were concerned with the theoretical and experimental investigation of wide-band electronic devices for U.H.F. The lecture by V.N. Shevchik, L.Ya. Mayofis and L.D. Pokrovskiy dealt with the extension of the known theories of travelling-wave tubes and backward-wave tubes to the practically important cases when the delay structure necessitated the taking into account of the discrete character of the interaction of the electron beam with the high-frequency field. The lecture by V.C. Stal'makhov, V.N. Shevchik and Yu.D. Zharkov was devoted to the simplified analysis of the operation of a backward-wave tube by employing the cosinusoidal approximation of the given field. The papers by V.B. Braginskiy, A.S. Gorshkov, A.I. Kostiyenko, G.P. Lyubimov, I.T. Trofimenko and V.V. Anisimov were concerned with the detailed experimental and theoretical investigation of the possibility (first indicated by V.N. Shevchik in 1954) of expanding the bandwidth of

Card3/16 the electronic trimming of reflex klystrons by means of the

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mutual synchronisation of several klystron tubes. The operation of reflex klystrons with multi-circuit resonant systems was also investigated. The results of experimental and theoretical investigation of two-ray amplifying and multiplying tubes were given in the communication by L.Z. Aitova, V.M. Lopukhin, L.A. Shkudova and in the communication of V.I. Kanavets. Some of the papers in the Electronics Section dealt with the investigations which were concerned with the development of novel U.H.F. devices, suitable for the generation and amplification of the wave-forms in the millimetre and sub-millimetre ranges. The papers of great interest were: "Experimental Investigations of the Radiation of the Electron Bunches in the Vicinity of Non-homogeneities" by V.B. Braginskiy and Ye.P. Mustel', "Comparison of the Efficiency of Certain Methods of the Generation of Millimetre Waves" by A.S. Tager and "Application of the Higher Spatial Harmonics of the Electromagnetic Field in Slowing-down Systems" by A.S. Tager and V.A. Solntsev. The problems dealing with various fluctuation phenomena in electron and gas-discharge devices and with the physics and applications of gas discharges at

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U.H.F. were discussed in the papers by S.A. Akhmanov, I.T. Trofimenko, G.F. Antonov and N.G. Tikhomirova, who investigated the phenomena in certain oscillatory U.H.F. systems; the problem was also discussed in the papers: "The Electron Velocity Distribution in a Disintegrating Plasma" by A.M. Aleskovskiy; "Frequency and Amplitude Fluctuations of the Oscillations of a 3-cm Klystron Oscillator" by V.N. Nikonov; "De-electronisation of Gas in a 10-cm Antenna Switch" by U.V. Gorokhov and "Detuning of Cavity Resonators by Means of Gas Discharges" by U.V. Gorokhov and I.T. Byzova. The lecture of S.A. Kornilov entitled "Reflex Klystron as a Regenerative U.H.F. Amplifier" was of great practical interest. The simplicity of the amplifier permits the application of this device in the whole range of equipment where the comparatively high level of noise is not important. The Section of Electrodynamics had six sessions, during which over 30 papers and communications were read. A considerable part of these was devoted to the theoretical and experimental investigations of the propagation of electromagnetic waves in various delay systems. The

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paper by V.M. Dashenkov entitled "Scattering Properties of Certain Rod-type Delay Systems" gave the scattering equation for a structure consisting of a number of arbitrarily-loaded rods (stubs). The equation was employed to analyse single-stage stub systems and the author found that the theory was in agreement with the experimental results. The communication by V.I. Bespalov and E.Ya. Daume entitled "Propagation of Electromagnetic Waves in a Non-uniform Helix" gave the results of a perturbation-method investigation of the effect of random longitudinal and radial displacements of the helix conductor on the characteristic of the delay system. The results obtained by the authors permit the evaluation of the tolerances in the helices employed in backward-wave tubes. The paper "Generalisation of the Circuit Theory Including the Helical Delay Systems" was concerned with the possibility of the application of small perturbing objects to the measurement of the coupling impedance in a wide range of delay systems. Apart from the theoretical justification of the above method of measuring the coupling impedance, the paper gave some experimental results.

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A.I. Shtyrov proposed (and proved by means of the reciprocity theorem) an interference method of the "cold" investigation of delay systems. The method permits the measurement of electrical non-homogeneities of delay systems, gives a high accuracy and requires comparatively little effort. The paper "Production of Periodic Structures by Means of Ultrasonics" by Ye.M. Gershenzon was devoted to the experimental investigations of an interesting modification of a periodic structure, i.e. a regular waveguide filled with a liquid in which an ultrasonic standing wave was excited. V.P. Sazonov described the results of an investigation of the distribution of electric fields in a number of important delay systems (combs, stub systems, etc.) by means of two methods (probes with a high-resistance input) and small perturbing objects). The author also obtained the distributions of tangential components of the electric fields along certain boundary surfaces, which are of considerable interest. In a number of cases, the author also measured the coupling impedance. Some of the lectures were devoted to the problems of diffraction

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patterns of antennae. Here one should mention the papers by Ye.N. Vasil'yev and S.M. Verevkin, dealing with the excitation of the solids of revolution. The analysis of the oscillations in π -type and toroidal volume resonators and in π -type and cross-shaped waveguides was given in the papers by V.L. Patrushev and V.M. Sedykh, respectively. A number of the papers in the Electrodynamics Section dealt with the complex phenomena appearing at the junctions of waveguides. Here, it is necessary to mention the papers: "The Calculation of Junctions" by Ya.M. Turover; "The Problem of Construction of Certain Wideband Matching Devices" by Ye.V. Anisimov and V.D. Luchinin and "Measurement of the Parameters of the Energy Outputs in U.H.F. Devices by Means of a Symmetrical Transformer" by I.A. Dukhovnikova and M.M. Rayner. The behaviour of various substances in electromagnetic fields at U.H.F. was discussed in the papers of O.V. Karpova, U.P. Radin, I.A. Shekhtman, A.I. Pilshchikov, A.L. Levinson, N.S. Sedletskaya and A.A. Kuznetsov. In the Radio-spectroscopy and Radio-astronomy Section, the most important papers were delivered by N.G. Basov, I.D. Murin, A.P. Petrov,

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A.M. Prokhorov, I.V. Shtranikh, K.K. Svidzinskiy, A.N. Orayevskiy, U.L. Klimontovich, R.V. Khokhlov, G.H. Vasneva, V.V. Grigor'yants, M.Ye. Zhabotinskiy, D.N. Klyshko, V.L. Sverdlov, Ye.I. Sverchlov, and V.V. Nikitin which dealt with the results of the theoretical and experimental investigations of various types of molecular oscillators (masers). The paper of N.G. Basov and his collaborators described the principle of operation of a molecular clock having an accuracy of 10^{-9} . The results of a theoretical investigation of the molecular radiation in high-frequency fields were given in the papers of V.M. Fayn, entitled "Radiation of the Molecules in Strong High-frequency Fields" and "The Spontaneous Radiation of Molecules at Ultra-high Frequencies". In the second of the above papers, the author came to the conclusion that the width of the spectral line of the spontaneous radiation at U.H.F. is finite. The author also proposed a classical analogy for the phenomenon of coherence in the spontaneous radiation. I.A. Deryugin investigated in his paper the revolution of the plane of

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polarisation and the ferromagnetic resonance in colloidal iron, nickel, cobalt and permalloy. The experiments were carried out over a wide band of frequencies and showed a strong dependence of the above effects on the losses in the samples. The works of A.M. Prokhorov, V.N. Zverev and L.S. Korniyenko were devoted to the investigation of the fine and ultra-fine structure of the spectrum of the electron paramagnetic resonance of the ions of chromium and iron in the lattice of aluminium oxide. The radio-spectroscope, constructed by the first two authors, made it possible to reveal the signal from a sample containing 3×10^{-11} mol of the paramagnetic ions of Cr^{3+} . The paper by V.V. Zheleznyakov, in which the author suggested a hypothesis concerning the origin of the sporadic radiation of Jupiter, aroused a considerable interest and lively discussion. According to the hypothesis, the bursts of the radiation from Jupiter are due to the plasma oscillations in its ionosphere. The author found a close correspondence between the parameters of the ionosphere of Jupiter and those of the layer F_2 of the Earth ionosphere.

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The paper contained also a hypothesis dealing with the analogous mechanism of the recently discovered sporadic radiation of Venus. The work of G.G. Getmantsev entitled: "The Theory of Magnetic Braking Mechanism of the Non-thermal Cosmic radiowave Radiation" eliminates the theoretical difficulties which are encountered when an attempt is made to consider the galactic plane as being the source of cosmic electrons. The author considered that the electrons are formed as a result of non-elastic collisions between the relativistic protons of the interstellar medium. I.G. Moiseyev described a 10-cm radio telescope, having a mobile (vibrating) directional pattern. The movement of the pattern is secured by periodically switching the input of the receiver from one antenna radiator to another, the radiators being situated in the vicinity of the focus of a parabolic reflector. G.G. Getmantsev described a simple modulator (switch) which was constructed for the above equipment at the Gor'kiy University by N.N. Kholodilov and A.V. Zakharov. The Radiowave Propagation Section had Card11/16nine papers and communications. The paper by B.N.Gersham

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entitled "The Theory of Large-scale Non-uniformities" proposed a theory analogous to that of the cellular Martin waves, which also took into account the effect of the magnetic field of the Earth. N.G. Denisov gave a theoretical analysis of the propagation of radiowaves through that region of the non-uniform magnetically-active plasma in which a partial absorption of the electromagnetic waves takes place due to the vicinity of the frequency of the external field and the natural frequency of the plasma. The author calculated the reflection coefficients and the propagation and absorption coefficients of the extraordinary wave for the transverse propagation and investigated the absorption of the ordinary and the extraordinary waves for the quasi-longitudinal propagation. The influence of the solar activity on the ionosphere was investigated in the papers by N.N. Yeryushev and N.A. Savich. As a result of the systematic measurement of the overall intensity of atmospherics at frequencies from 13-42 kc/s the various properties of the radiowaves were studied. Some conclusions relating to the influence of the chromospheric

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explosions on the sun on the ionosphere were also arrived at. The paper by A.A. Semenov and G.A. Karneyev entitled: "The Problems of the Statistical Evaluation of the Results of Measurements in the Investigation of the Rapid Fluctuations of Ultra-shortwave Radio Signals" aroused considerable interest; similarly, the paper by A.A. Semenov and Ch.Ts. Tsydypov under the title "Investigation of the Variations of the Direct Radio Signal Propagation in the Non-uniform Troposphere over a Ground Path" was of considerable interest. The latter paper gave some results of an experimental investigation of the fading of the direct ray over a medium-distance ground path. The statistical characteristics of the amplitude fluctuation of the signal were investigated and an attempt was made to clarify the mechanism of the signal variations. During the ensuing discussion, the great practical value of the above works was emphasised and it was suggested that the work should be extended in order to attain a greater accuracy. Twelve papers and communications were read at the Semi-conductor Section. L.C. Berman gave an approximate method of calculating the transients in a transistor operating with

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large signals. The method was based on a quasi-linear approximation and the transient was regarded as a switch-over from a conducting state (with constant equivalent parameters of the circuit) to a non-conducting state with zero-value parameters. The switch-over point was taken as the instant when the charge and the voltage on the base-emitter capacitance is zero. The author showed that the method is in good agreement with the experiment. "The Detector Crystals of Pressed Germanium" by Z.I. Kir'yashkina, described the technology of the preparation of germanium wafers for press-method diodes, whose main advantage is an almost complete absence of the loss of germanium. The results of an investigation of samples of p-n junction diodes showed that the method was promising for industrial applications. The influence of adsorption and illumination on the change of the contact potentials in the films of selenium and tellurium was investigated in the work of V.F. Bogolyubov, U.F. Lushkin and I.A. Nakrap. A paper of V.V. Pasynkov and Ya.I. Panova described the experiments on the development of semi-conductor loads for waveguides. The basic material was

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made of ultra-china clay (binder) and of grains of silicon carbide (the absorbing component). The investigation showed that the samples produced had satisfactory characteristics. The development of non-linear semiconductor resistances was described in a paper of V.V. Pasynkov and L.K. Chirkin; resistance elements for powers of 10-15W were produced and their applications were studied. A method of calculating an inverse peak current in p-n diodes was given in the paper of L.I. Baranov and M.C. Bekbulatov. The formulae obtained made it possible to explain various forms of the peaks observed in the experiments. The paper by Yu.N. Az'yan, G.N. Berestovskiy, L.N. Kaptsov, V.V. Migulin, K.S. Rzhevkin, K.Ya. Senatorov and T.N. Yastrebtseva contained a survey of the works dealing with the applications of transistors in various radio circuits. The transient processes in the base of the transistors were thoroughly investigated. The delay between the input and the output signals in a transistor was thought to provide the possibility of designing an oscillator without

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reactive elements and such oscillators were actually constructed. Some important engineering methods of designing various transistor circuits were developed. G.N. Berestovskiy read a paper in which he gave the analysis of the operation of a transistor AC-DC converter. The experimental data corroborated the accuracy of the formulae proposed by the author and showed that a high conversion efficiency could be obtained with a number of Soviet transistors. During the conference, a number of trips were arranged to various industrial establishments of the town of Saratov. During the closing plenary session of the conference, on September 28, a unanimous resolution summarising the work of the conference and containing recommendations with regard to the subject matter and the plans for the future work was adopted. It was also decided that the third All-Union conference of the Ministry of Higher Education of the USSR on radioelectronics would be held in Khar'kov in September, 1959.

SUBMITTED: December 7, 1957
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S/194/62/000/004/083/105
D271/D308

AUTHORS: Golubkov, P. V., Bakhrakh, L. E., Kozel', I. Sh.,
Kozlov, I. G. and Medoks, V. G.

TITLE: Study of certain properties of electron streams

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika,
no. 4, 1962, abstract 4zh106 (Uch. zap. Saratovsk.
un-t, 1960, 69, 41-56)

TEXT: Results are reported of a theoretical and experimental study of the structure of long electron streams, of diverse configuration, flowing in focussing fields. Ripple factors of the inner and outer surface of a hollow cylindrical electron stream, focussed by a permanent or periodic magnetic field, are computed and plotted. The possibility of holding ripples between definite limits, while voltage varies in a wide range, is shown. Formulas and graphs are obtained for the rippling of inner and outer surfaces of a hollow electron beam with centering electrostatic focussing. It is shown that the ripple amplitude is determined by the ratio of the inner

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Study of certain ...

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D271/D308

and outer radii of the beam. Effects of space charge are taken into account. Current density distribution in the cross-section of the beam and the rippling of its surfaces were experimentally investigated. A special adjustable collector system was used in this investigation. Density distribution curves were plotted point-by-point and displayed on an oscilloscope as well. Ribbon beam and hollow cylindrical beam were studied in a longitudinal magnetic field. Velocity distribution of electrons in electron beams was experimentally investigated. Cylindrical condenser was used as velocity analyzer. Experimental measurements were taken in various cross-sections of the beam, in a wide range of accelerating voltages and with various residual gas pressures. It is pointed out that the velocity distribution curve has two maxima, and possible explanations are discussed. / Abstracter's note: Complete translation. /

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ARTEM'YEV, Vladislav Nikolayevich; SHTROMBERGER, Lev Viktorovich;
NOSKOVA, R.F., red.; GOLUBKOV, P.V., prof., red.; ZENIN, V.V., tekhn.
red.

[Laboratory manual on high-vacuum physics] Praktikum po
fizike vysokogo vakuuma. Saratov, Izd-vo Saratovskogo univ.,
1963. 325 p. (MIRA 17:2)

18

Investigation of the operation of the Sakharov line
kin, Roostromproekt system. S. K. Golubkov and S.
Kazunikhov. *Sirovici. Material.* 1916, No. 1, 22-31.
B. B. Stefanovsky

18

18

Investigation of the work of the Swedish lime-burning
mill at the Kirovskan carbide plant. S. N. Golubkov and
A. D. Romanov. *Soviet. Metal.* No. 4, 30-9(1936).
W. R. Stefanovsky

ASB-55A METALLURGICAL LITERATURE CLASSIFICATION

PROCESS AND PROPERTIES INDEX																									
1ST AND 2ND ORDERS													3RD AND 4TH ORDERS												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
<p>Work of the existing lime-burning kilns and ways to increase their productivity. <i>S. Golubkov, Strodel.</i> Material. No. 3. 38-47(1036). <i>R. R. Stefanovsky</i></p>																									
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION																									
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GOLUBKOV, S. N.

GOLUBKOV, S. N. "Lime-burning furnaces in silicate brick plants", *Mest. stroit, materialy* 1948, Issue 8, p. 32-40.

SO: U-3042, 11 March 53, (*Letopis 'Zhurnal 'nykh Statey*, No. 7, 1949).

GOLUBEKOV, S., inzh.

Using high-production kilns for burning lime. Stroi. mat. ⁴
no. 4:11-13 Ap '58. (MIRA 11:5)
(Limekilns)

ГОЛУБКОВ, С., инж.

Graphic method for determining conditions for limekilning.
Stroi.mat. 4 no.10:12-16 0 '58. (MIRA 11:11)
(Limekilns)

Golubkov V.M.
GOLOVCHINER, Ya.M.; GOLUBKOV, V.M.

Coercive force and width of X-ray interference lines in low-
carbon alloyed steels. Probl. metalloved. i fiz. met. no.4:222-227
'55. (Steel alloys--Heat treatment) (MIRA 11:4)
(Ferromagnetism)

GOLUBKOV, V.M.; KRITSKAYA, V.K., kand.fiz.-mat.nauk

X-ray investigation of the carbide phase in patented steel wire.
Probl. metalloved. i fiz. met. no.4:461-464 '55. (MIRA 11:4)
(Wire) (X rays--Industrial applications)

GOLUBKOV, V.M.; IL'INA, V.A.; KRITSKAYA, V.K.; KURDYUMOV, G.V.; PERKAS,
M.D.

Studying physical factors determining the hardening of alloyed
iron. Fiz. met. i metalloved. 5 no. 3:465-483 '57. (MIRA 11:7)

1. Institut metallovedeniya i fiziki metallov Tsentral'nogo
nauchno-issledovatel'skogo instituta chernoy metallurgii.

(Iron alloys--Hardening)
(Deformations(Mechanics))

GOLUBKOV V. M.
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SOV/137-58-8-17729

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 219 (USSR)

AUTHORS: ~~Golubkov, V. M.~~, Il'ina, V. A., Kritskaya, V. K., Kurdyumov, G. V. Perkas, M. D.

TITLE: A Study of Physical Factors Determining the Hardening of Alloyed Fe (Izucheniye fizicheskikh faktorov, opredelyayushchikh uprochneniye legirovannogo zheleza)

PERIODICAL: Sb. tr. In-t metalloved. i fiz. metallov Tsentr. n.-i. in-ta chernoy metallurgii, 1958, Vol 5, pp 433-461

ABSTRACT: The dimensions of regions of coherent dispersion, D , and the magnitude of distortions of type 2, $\Delta a/a$, in pure Fe and in its α -solid solutions with Ni, Mn, Cr, Mo, V, Co, W, Ti, Nb, and Si were calculated by the width of the reflexes (110) and (220) obtained in FeK_α irradiation and recorded on a URS-50I X-ray spectrometer; the specimens employed were cold-rolled with an 80% reduction and were also cut into pieces and subjected to quenching. In addition, static distortions, $\sqrt{\bar{u}_{gt}^2}$, and the characteristic temperature, θ , were determined for the same annealed and deformed specimens by the changes in the intensity of spectra photographed under Mo

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SOV/137 58 8 17729

A Study of Physical Factors Determining the Hardening of Alloyed Fe

irradiation at -183°C and at room temperature. Micromechanical tests were conducted concurrently on a model RF-2 machine, and tensile stress-strain diagrams were plotted. Tables with values of D , $\Delta a/a$, $\sqrt{u_{st}^2}$, σ_s , σ_b , and H_v are given. It is shown that the magnitudes of D ($2-4 \times 10^{-6}$ cm), $\sqrt{u_{st}^2}$ (≈ 0.120 angstrom), and σ were fairly close to common values for almost all alloys that had been deformed. The authors comment on the fluctuations of the $\Delta a/a$ value, which varies from $0.5 - 2.5 \times 10^{-3}$ for different alloys and emphasize the correspondence which exists between its magnitude and the tensile-strength characteristics of the deformed alloys. The difference in magnitudes of σ and $\sqrt{u_{st}^2}$ of alloys in the annealed state is also pointed out. The mechanism of deformation and the effect of the factors indicated above on hardening of alloyed Fe are discussed. Bibliography: 37 references.

1. Iron alloys--Physical properties
2. Iron alloys--Hardening
3. Mathematics

A. B.

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126-5-3-12/31
AUTHORS: Golubkov, V.M., Il'ina, V.A., Kritskaya, V.K.,
Kurdyumov, G. V. and Perkas, M.D.
TITLE: Study of the Physical Factors which Determine the
Hardening of Alloyed Iron (Izucheniye fizicheskikh
faktorov, opredelyayushchikh uprochneniye legirovannogo
zheleza)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 5, Nr 3,
pp 465-483 (USSR)

ABSTRACT: This paper is devoted to the study of the physical
factors which determine the hardening of α -iron alloyed
with various elements; considering only hardening which
is due fully to changes in the fine structure of the
 α -solid solution without any changes in its chemical
composition. In the experiments iron was used alloyed
with various elements; the chemical compositions of the
respective binary alloys of iron are entered in Table 1,
p.465. The material was produced in a high frequency
furnace with ingot weights of 25 kg. All the ingots were
subjected to diffusion annealing at 1200°C for twenty
hours. After homogenization annealing, the ingots were
forged to a square 50 x 50 mm. After forging most of
the ingots were annealed for the purpose of obtaining a
uniform grain size. After forging and annealing, the

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Study of the Physical Factors which Determine the Hardening of Alloyed Iron

blanks were cold rolled with a total reduction of 80% and from the produced strips flat specimens were cut which were used for measuring the hardness and also for micro-mechanical investigations. The alloys Fe + 3% Mn, Fe + 4% Ni, Fe + 8% Cr were also hardened by quenching in a 10% NaOH solution after the specimens have been heated in a salt bath to 1000°C. The alloys Fe + 3% Mn, Fe + 0.5% Ti, Fe + 0.6% W and non-alloyed iron were also used for studying the influence of step-wise deformation on the changes in the characteristics of the fine structure. Specimens with initial dimensions of 70 x 15 x 8 mm were deformed in the cold state (on a laboratory rolling stand) with reductions of 5, 10, 15, 20, 30, 50, 80 and 90%. The characteristic of the fine structure was also studied on filings obtained from the alloys Fe + 1.84% Co, Fe + 1.8% Mo, Fe + 2.28% V, Fe + 3% Mn, Fe + 4% Ni, Fe + 8% Cr. Distortions of the third type and the characteristic temperature were determined predominantly on specimens produced from powders. The fundamental

Card 2/9 methods of studying the influence of alloying elements on

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Study of the Physical Factors which Determine the Hardening of Alloyed Iron

the hardening of the ferrite were: X-ray structural analysis and mechanical tests. The authors investigated the relation between the fine crystalline structure of α -iron base solid solutions in the work hardened state and also some of the mechanical properties of these alloys. Hardening of the alloys was achieved by cold plastic deformation as a result of the martensitic γ to α transformation mechanism. For changing the properties of the crystals of α -iron in the micro and sub-micro ranges (properties of the crystal lattice of the α -solid solution), the iron was alloyed by various elements, namely: Si, Ti, V, Cr, Mn, Co, Ni, Nb, Mo, W. By means of X-ray structural methods the following properties of α -phase crystals were studied in the sub-micro regions: static lattice distortions caused by the presence of foreign atoms in the lattice; dynamic displacements of the atoms during thermal oscillations and the characteristic temperature; magnitude of the elastic deformation of the lattice caused by cold plastic deformation. As characteristics of the fine crystalline structure of the alloys in the hardened state the following were applied: size of the regions of the

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coherent scattering of X-rays (mosaic block), distortions of the second type and of the third type. The mechanical properties of the micro-volumes were characterised by the hardness, the yield point and the strength values. The results led to the following conclusions:

1. A characteristic feature of alloys in the hardened state obtained by a high reduction in the cold state or as a result of the γ to α martensitic transformation is the low value of the regions of coherent scattering of X-rays. The size of these regions for all these alloys is within the limits of 200 to 400 Å. The observed difference in the size of the blocks is near to the limit of the error in measuring them. However, the strength characteristics change within wide limits on changing over from one alloy to another (hardness, H_V between 172 and 340; σ_s between 54 and 113 kg/mm²). Thus, the great difference in the resistance to deformation of various alloys in the hardened state cannot be attributed to changes in the sizes of the blocks.

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2. The presence of various elements in the solid solution

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influences to a considerable extent the type II distortions (non-uniform micro-stresses) in deformed as well as in hardened alloys. A correspondence exists between the magnitude of these type II distortions and the strength values of alloys in the hardened state.

3. High degrees of plastic deformation bring about considerable type III distortions. In the investigated solid solutions considerable displacements of the atoms take place in alloys in the annealed state, which is caused by the presence in the atom lattice of dissolved elements; $\sqrt{\bar{u}_{cm}^2}$ varied between 0.058 and 0.120 Å (\bar{u}_{cm}^2 being the magnitude of the static displacements of the atoms). After deformation with a high degree of reduction in the cold state (filings) the magnitude of $\sqrt{\bar{u}_{cm}^2}$ increased approximately to the same level (about 0.100 to 0.120), which is near to the level of type III distortions in cold deformed non-alloyed iron. The higher the value of $\sqrt{\bar{u}_{cm}^2}$ for the

Card 5/9 "equilibrium" solid solution, the smaller was the change

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in this magnitude as a result of the deformation.
4. After hardening of the alloyed iron to martensite, the magnitude of the static displacements did not increase. Thus, in alloys hardened by means of martensitic transformation no type III distortions occur, although the strength characteristics approach those of materials deformed in the cold state. This could be seen particularly clearly on specimens of pure iron, hardened to produce martensite. No type III distortions were detected and hardening, block sizes and type II distortions were on the same level as in the case of iron deformed in the cold state. Consequently, presence of type III distortions at least of a magnitude detected in measurements by means of intensive X-rays is not a necessary condition for obtaining a high resistance to deformation.

5. Investigation of the fine crystalline structure as a function of the degree of plastic deformation carried out on pure iron and on some solid solutions has shown that with increasing degree of deformation the hardness, the type II and type III distortions increase, whilst the sizes of the

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blocks decrease. These characteristics change most rapidly for low degrees of deformation; for deformations of 30 to 70% the change of these characteristics is slow. For higher degrees of deformation the speed of the change in the characteristics increases again. The behaviour of the metal in the case of very high degrees of plastic deformation requires further detailed investigation.

6. The obtained results permit the conclusion that breaking up of the regions of coherent scattering is a necessary condition for increasing the resistance to deformation of the metals (in the case of the "sliding" mechanism of plastic deformation). The differences in the absolute magnitudes of the characteristics of the resistance to deformation for various metals and solid solutions is due mainly to the differing properties of the crystals in the micro and sub-micro regions (character and force of the bond, static distortions and other deviations from the regular periodicity of the lattice) and not by changes in the size of these regions.

Card 7/9 The established correspondence between the resistance to

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deformation and the magnitude of type II distortions should not be taken as an indication of the major role of these distortions from the point of view of hardening. It can be assumed that the magnitude of these distortions (non-uniform elastic deformations of the micro-regions) is itself due to the properties of the crystallites of the given material. From this point of view the magnitude of type II distortions serves as an evaluation of the limit of elastic deformation of the micro-regions and can be considered as being a definite characteristic of the properties of the crystallites of a given substance. It is also possible that the observed type II distortions influence the resistance to deformation causing an increase in the degree of deorientation of the blocks. The experimental data obtained in the here described work on the relation between the fine structure and the strength of a material permit establishing certain relations governing these phenomena and leads to a number of new problems, the elucidation of which by further experiments is important from the point of view of

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understanding the nature of strength and hardening (work
hardening) of metals and alloys.
There are 6 figures, 6 tables and 38 references,
29 of which are Soviet, 9 English.

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1. Iron alloys--Hardening
2. Iron alloys--Physical properties
3. Iron alloys--X-ray analysis
4. Iron alloys--Crystal structure

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